

EXHIBIT 4

DEPOSITION OF JOSEPH KLOEPPER - 1/19/2011

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5	Plaintiffs.	5	Exhibit 120 Exhibit C of PR 4-3 Joint Claim Construction and Pre-Hearing Statement entitled Summary of the Proposed Testimony of Defendants' Expert Witness
6	vs.	6	
7		7	
8	THE ESPOMA COMPANY, ADVANCED MICROBIAL SOLUTIONS, L.L.C., and CALLOWAY'S NURSERY, INC.,	8	Exhibit 121 Summary of the asserted claims from each one of the three asserted patents
9	Defendants.	9	
10		10	
11		11	Exhibit 122 Curriculum vitae of Joseph W. Kloepper and recent publications
12	VIDEOTAPED DEPOSITION OF JOSEPH KLOEPPER JANUARY 19, 2011 9:00 A.M.	12	
13		13	Exhibit 123 Defendants The Espoma Company And Calloway's Nursery's Preliminary Invalidity Contentions For U.S. Patent No. 7,044,944, U.S. Patent No. 6,878,179 and U.S. Patent No. 7,442,224
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15	HILL, KERTSCHER & WHARTON, LLP 3350 RIVERWOOD PARKWAY SUITE 800 ATLANTA, GEORGIA	15	
16		16	Exhibit 124 Collection of documents supplied by Espoma containing numerous documents by Plant Right
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<p>1 connection or did it involve doing laboratory 2 testing? 3 A. Yes, sir, laboratory and greenhouse 4 testing. 5 Q. Greenhouse testing. And has your 6 activities for any of these companies ever 7 involved performing field tests? 8 A. Yes. 9 Q. And that would be measuring the crop 10 yield resulting from application of certain 11 fertilizers and other materials? 12 A. It involves determining the effect of 13 microbial inoculants on plant growth overall, 14 yes. 15 Q. Mr. Kloepper, you have given your 16 deposition before, true? 17 A. I have given a deposition before, yes. 18 Q. Have you given only one deposition 19 before? 20 A. Yes. 21 Q. And have you also testified at trial? 22 A. Yes, I have. 23 Q. And you understand then that the 24 testimony that you give today might be 25 compared to testimony at trial or at the</p>	<p>9</p>	<p>1 exact date, but more or less a week to two 2 weeks ago. 3 Q. Okay. And did you meet with anybody 4 to -- at any point in time in relation to 5 preparing for the deposition? 6 A. No, I did not. 7 Q. Did you review any documents in 8 preparation for your deposition? 9 A. Yes, I did. 10 Q. And can you tell me what those 11 documents were?</p>	<p>11</p>
<p>1 hearing in this case? 2 A. Yes, I do. 3 Q. And so if I ask you a question today 4 and you give one answer and I ask that same 5 question at the hearing or at trial and you 6 give a different answer, I'll ask you to 7 explain the discrepancy between the two. 8 A. I understand. 9 Q. And I'm going to ask questions as 10 clearly as I can. If there's a question that 11 you don't understand, tell me what part of the 12 question you don't understand and I'll try to 13 fix it. 14 A. Okay. 15 Q. And likewise, if you answer a 16 question, I'm going to assume and the judge 17 and the jury is going to assume that you 18 understood the question when it was asked. 19 A. I understand. 20 Q. Okay. Mr. Kloepper, did you prepare 21 for your deposition today? 22 A. Yes, I did. 23 Q. When did you begin preparing for that 24 deposition? 25 A. About -- I honestly don't remember the</p>	<p>10</p>	<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p>	<p></p>

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<p style="text-align: right;">25</p> <p>1 Q. Are you a person of ordinary skill in 2 the art? 3 A. I am. 4 Q. And what art is -- does that refer to? 5 How would you define the art? 6 A. In the broadest sense, it's 7 microbiology. Most of these are concepts of 8 microbiology. It's also the art of using 9 microbial inoculants for achieving effects on 10 plants, because it talks about terms related 11 to application of these and affects how the 12 plant responds. 13 Q. Okay. So it's microbiology applied to 14 plants? 15 A. That's a good way to put it. 16 Q. Okay. Please refer to the document 17 that's been marked as Deposition Exhibit 122. 18 A. Okay. 19 Q. And would you tell us what Exhibit 122 20 is? 21 A. It looks -- it's a print off of a web 22 page that has my basic -- a summary of my 23 research and some key-out parts from my 24 curriculum vitae and recent publications. 25 Q. Would you confirm for us that that</p>	<p style="text-align: right;">27</p> <p>1 those, it identifies your experience from 1979 2 as an Assistant Professor of plant pathology 3 up until the present, where you are now 4 Professor of the Department of Plant Pathology 5 at Auburn University. Do you see that? 6 A. Yes. There is one slight error. It's 7 the Department of Entomology and Plant 8 Pathology. The name has changed. 9 Q. That's your current position? 10 A. Yes, sir. 11 Q. Now, I noticed that you have listed a 12 number of articles and publications, and I've 13 attached not just the primary publications, 14 but also the ones that were identified as 15 additional publications. Do you see that? 16 A. Yes, I do. 17 Q. Are these publications relevant to 18 your proposed testimony in this case? 19 A. Yes, they are. 20 Q. Which publications are relevant to 21 your testimony in this matter? 22 A. I would submit that all are relevant 23 in the broadest sense because all of them are 24 involving bacteria and their effects on plants 25 in some way.</p>
<p style="text-align: right;">26</p> <p>1 document is an accurate representation of your 2 technical background? 3 A. Yes, it is. 4 Q. And this accurately identifies the 5 degrees that you hold? 6 A. Yes, it does. 7 Q. It states that you have a -- you 8 received your degree in botany and plant 9 pathology, Bachelor of Science from Colorado 10 State University, in 1975. 11 A. Yes. 12 Q. And you received a Master's in plant 13 pathology at Colorado State University in 14 1977. 15 A. Yes. 16 Q. And in 1980 you received a Ph.D. in 17 plant pathology at the University of 18 California, Berkeley. 19 A. Correct. 20 Q. And the thesis relating to your Ph.D. 21 was the role of rhizobacteria in increasing 22 plant growth and yield, is that right? 23 A. Yes, sir. 24 Q. And then I see under your professional 25 experience, and I won't go through each one of</p>	<p style="text-align: right;">28</p> <p>1 Q. What is rhizobacteria? 2 A. It's a word that means root colonizing 3 bacteria. 4 Q. And what does root colonizing mean? 5 A. It means that when the bacteria are 6 applied to a plant or to seeds of a plant, 7 that the inoculated strains of bacteria 8 actually grow on the plant and grow along the 9 roots. 10 Q. So it's the bacteria that is applied 11 to the plant that grows on the roots? 12 A. That's right. 13 Q. Is any other -- does any other 14 bacteria grow on the roots or around the 15 roots? 16 A. Yes. There's always a background of 17 bacteria on any plant in the environment, so 18 they have many different bacteria also. 19 Q. And what is your understanding of what 20 the term rhizosphere means to a person of 21 ordinary skill in the art? 22 A. The rhizosphere is an area around the 23 root, it's a physical area, you can measure 24 it, somewhere around 1 to 2 millimeters it's 25 commonly said, but the functional -- or the</p>

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<p style="text-align: right;">29</p> <p>1 real importance is that it's the area where</p> <p>2 nutrients come out of the plant, we call that</p> <p>3 leeching, nutrients leech out of the root and</p> <p>4 those nutrients stimulate soil micro --</p> <p>5 microflora, which means bacteria and fungi,</p> <p>6 and those organisms grow. So putting that</p> <p>7 together, the rhizosphere is the zone of</p> <p>8 influence around the root, the zone of</p> <p>9 microbial influence.</p> <p>10 Q. And you mentioned bacteria and fungi.</p> <p>11 A. Yes.</p> <p>12 Q. What's the difference between those</p> <p>13 two?</p> <p>14 A. In the classification of</p> <p>15 microorganisms, which are things smaller, that</p> <p>16 you can't see with the naked eye, there's</p> <p>17 various major groups. Bacteria is one group.</p> <p>18 Fungi are another group. Fungi are more</p> <p>19 advanced. They're molds.</p> <p>20 In bread molds when you see that mold or</p> <p>21 you see the mold on your strawberries that you</p> <p>22 just paid a lot of money for, that's fungus</p> <p>23 growing on it. And bacteria are smaller than</p> <p>24 fungi. We don't see them with our naked eye.</p> <p>25 Q. Is it true that bacteria is</p>	<p style="text-align: right;">31</p> <p>1 of PGPR, the plant growth promoting</p> <p>2 rhizobacteria, are in the specific field of</p> <p>3 microbial inoculants.</p> <p>4 Q. Plant growth promoting --</p> <p>5 A. Rhizobacteria.</p> <p>6 Q. Rhizobacteria. Now, is rhizobacteria</p> <p>7 a shorthand for plant growth promoting</p> <p>8 rhizobacteria?</p> <p>9 A. No, it's just a subset. Rhizobacteria</p> <p>10 is specifically root colonizing bacteria.</p> <p>11 Q. So it's a bacteria that promotes the</p> <p>12 growth of other bacteria in the vicinity of</p> <p>13 the rhizosphere?</p> <p>14 A. No, it's the -- rhizobacteria are the</p> <p>15 root colonizing bacteria. And some of those</p> <p>16 -- when bacteria colonize roots, they can have</p> <p>17 different effects on the plant. So we're</p> <p>18 talk -- plant growth promoting rhizobacteria,</p> <p>19 PGPR, are those root colonizing bacteria which</p> <p>20 cause benefits to the plant.</p> <p>21 Q. Okay. So a PGPR is a subset of</p> <p>22 rhizobacteria?</p> <p>23 A. Correct.</p> <p>24 Q. And it's a subset that actually</p> <p>25 promotes the growth of a plant?</p>
<p style="text-align: right;">30</p> <p>1 single-celled organisms?</p> <p>2 A. Yes.</p> <p>3 Q. And fungi is multi-celled organisms?</p> <p>4 A. Yes, uh-huh.</p> <p>5 Q. Does the word microbes mean anything</p> <p>6 to you?</p> <p>7 A. Microbes is a kind of generic term, a</p> <p>8 common word for short, which means</p> <p>9 microorganisms.</p> <p>10 Q. Okay.</p> <p>11 A. Yes.</p> <p>12 Q. So a microbe is a microorganism which</p> <p>13 can be a bacteria or a fungus?</p> <p>14 A. Correct.</p> <p>15 Q. Or something else?</p> <p>16 A. Correct.</p> <p>17 Q. And you mentioned that all of the</p> <p>18 articles, the publications listed in your CV,</p> <p>19 Exhibit 122, are relevant in the broad sense</p> <p>20 to your testimony, is that right?</p> <p>21 A. Yes.</p> <p>22 Q. Are any of these more relevant than</p> <p>23 others to your testimony?</p> <p>24 A. Well, we could say that because the</p> <p>25 ones which are directly involving the aspects</p>	<p style="text-align: right;">32</p> <p>1 A. Correct, promotes growth, and I need</p> <p>2 to add one thing there, or protects against</p> <p>3 plant disease.</p> <p>4 Q. Okay. And would that be considered a</p> <p>5 beneficial microorganism?</p> <p>6 A. Yes.</p> <p>7 Q. So is there any difference in your</p> <p>8 mind between a PGPR and a beneficial</p> <p>9 microorganism as that term has been used in</p> <p>10 the patent?</p> <p>11 A. I'm pausing because I don't recall all</p> <p>12 the ways in the patent that they used the term</p> <p>13 beneficial, if they were restricting that to</p> <p>14 plant growth. But in general terms, common</p> <p>15 use in language, beneficial is a broader term</p> <p>16 than plant growth promoting.</p> <p>17 Q. Okay. Now, you've studied the patents</p> <p>18 in this case, right?</p> <p>19 A. Yes, sir.</p> <p>20 Q. And you're familiar with the bacteria</p> <p>21 that are identified?</p> <p>22 A. Yes.</p> <p>23 Q. And that includes the different</p> <p>24 species bacillus?</p> <p>25 A. Yes.</p>

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<p style="text-align: right;">33</p> <p>1 Q. Are each one of the bacillus bacteria 2 identified in this patent PGPR bacteria? 3 A. I can't say that they are because PGPR 4 is a functional trait, not a taxonomic trait. 5 Q. Well, in your opinion, is the bacillus 6 bacteria identified in the patent functionally 7 a PGPR? 8 MR. SCHULTZ: Objection to form. 9 THE WITNESS: Can you clarify what 10 you -- I'm not sure what you mean by the 11 bacteria identified. 12 BY MR. ELLIOTT: 13 Q. Well, here's -- I'll ask it a 14 different way. 15 A. Okay. 16 Q. I just want -- I'm trying to connect 17 your background, your articles, your 18 publications, your training with your 19 testimony in this case. And I know that you 20 have written articles on PGPR, and I think you 21 even have at least one patent referring to 22 PGPR, is that right? 23 A. I believe so, yes. 24 Q. Okay. My -- so what I'm trying to 25 find out is does that experience with PGPR</p>	<p style="text-align: right;">35</p> <p>1 Rhizobia as a genus can be considered a PGPR. 2 There's several -- the taxonomy is changing 3 in bacteria, so there's many different 4 species. There are species in the group that 5 bacillus is in that are not now considered 6 bacillus as a genus, not to be too technical, 7 but it -- the taxonomy is a moving target in 8 bacteriology, unfortunately. 9 Q. Let me do this. Are there any of your 10 publications that you actually reviewed or 11 referred to in preparation for the development 12 of the definitions in this case? 13 A. No, not for the development of the 14 definitions. 15 Q. Okay. So when you developed the 16 definitions in this case, that was based on 17 the language of the claims, true? 18 MR. SCHULTZ: Objection, assumes 19 facts not in evidence. You may answer. 20 MR. ELLIOTT: I'll ask that again. 21 BY MR. ELLIOTT: 22 Q. Did you play any part in preparing the 23 definitions of the disputed terms, numbers 1 24 through 27, in this case? 25 A. I'm pausing because I'm trying to</p>
<p style="text-align: right;">34</p> <p>1 relate to or support your testimony in this 2 case about the bacillus bacteria? 3 A. Oh. Yes, because most of the cases of 4 PGPR that I have worked with have been 5 bacilli, which includes bacillus, the species 6 -- I mean the genus. 7 Q. And is it -- is it categorically true 8 that a PGPR bacteria improves or increases the 9 growth of the plant? 10 A. It increases the growth or provides 11 disease control. 12 Q. Okay. So it's good for the plant? 13 A. Absolutely. 14 Q. And are there any PGPR bacteria that 15 are not bacillus? 16 A. Yes. 17 Q. What are some examples of PGPR that 18 are not bacillus that would be bacteria? 19 A. Okay. Well, I should add that not all 20 bacillus are PGPR because it depends on the 21 strain. That's a very important idea. So 22 some bacteria that are not bacillus that have 23 strains in that group that are PGPR include 24 pseudomonas as a genus, pseudomonas 25 fluorescens as a species, pseudomonas putida.</p>	<p style="text-align: right;">36</p> <p>1 remember the process. I was asked to comment 2 on them. I did not draft them. 3 Q. Okay. Did you correct any of them, 4 the drafts, or did you just approve them? 5 A. I wouldn't say I corrected. To the 6 best of my recollection, we had a conversation 7 about -- in advance of seeing this what things 8 like a strain mean, what -- some of the terms. 9 I didn't correct a document. 10 Q. Okay. But in reviewing the disputed 11 terms and their definitions, numbers 1 through 12 27, you considered the patent specification 13 itself, true? 14 A. Can you try that question again? 15 Q. When you reviewed the claim terms or 16 the definitions for the claim terms -- 17 A. Which document is this now? 18 Q. Okay, let's start over. Well, we'll 19 get to that. 20 Here's my question is when you -- I want to 21 understand what you considered, what was in 22 your mind as the basis for your opinion that 23 each of the definitions of the disputed terms, 24 numbers 1 through 27, was an accurate 25 definition.</p>

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<p style="text-align: right;">53</p> <p>1 together is for us to have a discussion about 2 these terms. I think we should start with the 3 definition of the term yield. 4 Your testimony to the Court will be that 5 the term yield means increasing the amount of 6 food crop harvested per unit area of land, is 7 that right? 8 A. Yes. 9 Q. And your testimony will be that the 10 yield is not measured on an individual plant, 11 is that right? 12 A. I would say it's not commonly measured 13 on an individual plant, and the reason I'm 14 saying that is I'm sure we'll find papers 15 where somebody says yield was determined, say, 16 in a greenhouse on something like a tomato and 17 it might have been done on so many plants. So 18 in the broadest sense, people use the term 19 yield in a more specific way. But I would 20 agree that the most common way of measuring 21 and determining yield, especially in fields, 22 it's not on an individual plant. 23 Q. Okay. So it's the amount of food crop 24 harvested per unit area of land and not 25 measured on an individual plant; that's your</p>	<p style="text-align: right;">55</p> <p>1 into surrounding waters. 2 A. Well, that's more specific in a way 3 because it's talking about it can move into 4 soil separately and it can move into water 5 separately, and both of those are important 6 issues right now. 7 Q. Okay. So the -- nitrogen is either 8 washed out of the soil or into the surrounding 9 waters, and that's the nitrogen effect? 10 A. Yes. 11 Q. So would it be more accurate for me to 12 change the word "and" to "or" in defendants' 13 construction? 14 A. I don't think that's necessary because 15 if it's washed out of the soil, it goes into 16 surrounding waters. It's either the 17 groundwater or the surface waters. So that 18 wording is -- encompasses both of those. 19 Q. Okay. But it could mean -- it could 20 be washed out of the soil, but if there's no 21 surrounding waters, then it's still a nitrogen 22 effect? 23 A. Well, I'm trying to think where it 24 would end up if it washed out of the soil that 25 would meet that criteria. If it didn't end up</p>
<p style="text-align: right;">54</p> <p>1 opinion? 2 A. Most commonly, yes. 3 Q. Claim term number 21 then refers to -- 4 or is nitrogen effect. Do you see that claim 5 number 21 -- 6 A. Right. 7 Q. -- claim term number 21? Defendants 8 have identified this or defined this as the 9 effect of nitrogen washed out of the soil and 10 into surrounding waters. Do you see that? 11 A. Right. 12 Q. And do you agree with defendants' 13 definition of nitrogen effect? 14 A. Yes, and especially with the added 15 comments about being harmful to the 16 environment. So it's the nitrogen that washes 17 out of -- into the soil and into surrounding 18 waters and causes problems. 19 Q. Now, the plaintiffs have defined it as 20 the harmful effect of nitrogen on the 21 environment. Do you see in the column 22 plaintiffs' construction and support? 23 A. Uh-huh. 24 Q. The defendants have defined it as the 25 effect of nitrogen washed out of the soil and</p>	<p style="text-align: right;">56</p> <p>1 in the water and it washed out of the soil, it 2 might end up on a street or a freeway, and 3 that wouldn't really be a problem necessarily 4 on that area. I think the general -- most 5 general is if it washes out of the soil, I'm 6 trying to get at that it really would wash 7 into water then. 8 Q. So it has to wash into surrounding 9 waters for it to be considered nitrogen 10 effect? 11 A. Into surrounding waters. If we 12 include in surrounding waters, yes. My 13 understanding of surrounding water is it also 14 includes the groundwater. 15 Q. Oh, okay. So it can stay in the soil 16 and just get mixed in with the groundwater and 17 be considered a nitrogen effect? 18 A. Well, almost, but I wouldn't say stay 19 in the soil because we consider that the 20 drinking water, the groundwater, that's what 21 we're talking about, municipal water supplies, 22 is below the active zone of soil, so to enter 23 there, the nitrogen would move out the soil 24 into the groundwater. 25 Q. I see. So it has to leave the soil</p>

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<p style="text-align: right;">57</p> <p>1 for it to be a nitrogen effect?</p> <p>2 A. Yes.</p> <p>3 Q. What if it's vaporized?</p> <p>4 A. It depends what form the nitrogen is.</p> <p>5 But leaving the soil is -- that is one way</p> <p>6 that the nitrogen leaves the soil. Certain</p> <p>7 amounts -- nitrous oxide is a greenhouse gas</p> <p>8 that is given off from soils, and that does</p> <p>9 cause problems.</p> <p>10 Q. Okay. So that would be another</p> <p>11 nitrogen effect is nitrogen that leaves into</p> <p>12 the atmosphere as a greenhouse gas?</p> <p>13 A. Yes.</p> <p>14 Q. And you said that's nitrous oxide?</p> <p>15 A. Yes.</p> <p>16 Q. Now let's look at claim number 22 --</p> <p>17 I'm sorry, claim term -- I'll just say term</p> <p>18 number 22, Exhibit 119. In the defendants'</p> <p>19 column it refers to term number 23. Do you</p> <p>20 see that?</p> <p>21 A. No. Oh, on Page 38?</p> <p>22 Q. Right. You see in the right-hand</p> <p>23 column at the bottom it says see term number</p> <p>24 23?</p> <p>25 A. 23 herein, uh-huh.</p>	<p style="text-align: right;">59</p> <p>1 A. Yes.</p> <p>2 Q. So the word enhance yield in term</p> <p>3 number 23 means to cause an increase in the</p> <p>4 yield?</p> <p>5 A. Right.</p> <p>6 Q. And a time sufficient refers to the</p> <p>7 time between the application of the fertilizer</p> <p>8 and the time of the harvest?</p> <p>9 A. Is that the question?</p> <p>10 Q. That is my question. I'm trying to</p> <p>11 connect some dots here. The word time in term</p> <p>12 number 23 is included in the definition as</p> <p>13 time before harvest, right?</p> <p>14 A. In number 23 --</p> <p>15 Q. Yes.</p> <p>16 A. -- the time sufficient to enhance</p> <p>17 yield of a plant while reducing nitrogen</p> <p>18 effect. Oh, on the other column. Yeah, time</p> <p>19 before harvest. Right.</p> <p>20 Q. Right. So the word time in term</p> <p>21 number 23 corresponds to time before harvest,</p> <p>22 right?</p> <p>23 A. That's correct.</p> <p>24 Q. And the word sufficient refers to it</p> <p>25 being early enough to cause an increase in the</p>
<p style="text-align: right;">58</p> <p>1 Q. So if we go to Page 40, that's term</p> <p>2 number 23. We see term number 23 is a time</p> <p>3 sufficient to enhance yield of the plant while</p> <p>4 reducing nitrogen effect. Do you see that?</p> <p>5 A. Yes.</p> <p>6 Q. Okay. So term number 22 is not</p> <p>7 defined in the document, but term number 23 is</p> <p>8 defined, right?</p> <p>9 A. That's correct.</p> <p>10 Q. And term number 23 is defined as</p> <p>11 applying the fertilizer composition at a time</p> <p>12 before harvest that is early enough for the</p> <p>13 fertilizer to cause an increase in the yield.</p> <p>14 For vegetables and rice it is from planting to</p> <p>15 harvest. For other food plants, 30 days from</p> <p>16 budding to harvest.</p> <p>17 Do you see that definition?</p> <p>18 A. Yes.</p> <p>19 Q. And that's the defendants' proposed</p> <p>20 definition of term number 23, right?</p> <p>21 A. That's correct.</p> <p>22 Q. And do you agree with that definition?</p> <p>23 Do you agree that that's a definition that a</p> <p>24 person of ordinary skill in the art would give</p> <p>25 to term number 23?</p>	<p style="text-align: right;">60</p> <p>1 yield -- or let me rephrase that. I'll start</p> <p>2 over.</p> <p>3 The term sufficient to enhance yield</p> <p>4 appears in the definition as early enough for</p> <p>5 the fertilizer to cause an increase in the</p> <p>6 yield, right?</p> <p>7 A. Correct.</p> <p>8 Q. So the time is actually a period of</p> <p>9 time.</p> <p>10 A. That's right.</p> <p>11 Q. And if we look at the period of time,</p> <p>12 it's between when the fertilizer is applied</p> <p>13 next to the plant roots and the point in time</p> <p>14 when the plant is harvested.</p> <p>15 MR. SCHULTZ: Objection to form.</p> <p>16 MR. ELLIOTT: Okay, I'll rephrase</p> <p>17 that.</p> <p>18 BY MR. ELLIOTT:</p> <p>19 Q. In claim number 23, as defined in</p> <p>20 number -- in the right-hand column, the time</p> <p>21 referenced is a period of time, right?</p> <p>22 A. Yes.</p> <p>23 Q. And that period of time in the context</p> <p>24 of this term is -- has a starting point and an</p> <p>25 ending point.</p>

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<p style="text-align: right;">61</p> <p>1 A. Correct.</p> <p>2 Q. The starting point is when the</p> <p>3 fertilizer is applied next to the plant,</p> <p>4 right?</p> <p>5 A. Right.</p> <p>6 Q. And the ending point is when the plant</p> <p>7 is harvested, right?</p> <p>8 A. That's right.</p> <p>9 Q. So that time can change depending on</p> <p>10 when the fertilizer is applied and when the</p> <p>11 plant is harvested?</p> <p>12 A. That's what it's saying, yes.</p> <p>13 Q. Right. So for some plants it could be</p> <p>14 30 days, right?</p> <p>15 A. That's right.</p> <p>16 Q. For other plants it could be four</p> <p>17 months?</p> <p>18 A. Correct.</p> <p>19 Q. But it has to be a time sufficiently</p> <p>20 before the harvest to cause an increase in the</p> <p>21 yield.</p> <p>22 A. That's right.</p> <p>23 Q. Now, how is -- and claim number 23 --</p> <p>24 well, let me restart the question.</p> <p>25 We said that claim number 22 is not defined</p>	<p style="text-align: right;">63</p> <p>1 between the rhizosphere of the plant -- oh,</p> <p>2 I'm sorry, it splits onto the next page -- and</p> <p>3 the composition for a time. All right. I see</p> <p>4 that they're principally the same.</p> <p>5 Q. So when you apply fertilizer to a</p> <p>6 plant soil around the root structure next to</p> <p>7 the root zone, by applying it in that location</p> <p>8 and letting it sit there, you're going to</p> <p>9 maintain contact.</p> <p>10 A. I don't think -- in my understanding,</p> <p>11 they're not really -- saying these two are</p> <p>12 principally the same isn't saying that the</p> <p>13 fertilizer maintains contact but it's saying</p> <p>14 that the effect of the fertilizer, the</p> <p>15 fertilizer is put on and parts of the</p> <p>16 fertilizer -- the nutrients from the</p> <p>17 fertilizer are in the root zone; in the</p> <p>18 broadest sense, that's what we're talking</p> <p>19 about here, and that that needs to be there</p> <p>20 for enough time to have an effect on the</p> <p>21 plant.</p> <p>22 Q. Right.</p> <p>23 A. So that can all be described also as</p> <p>24 maintaining the fertilizer presence for a time</p> <p>25 sufficient to have contact. That's the way I</p>
<p style="text-align: right;">62</p> <p>1 -- claim term number 22 is not defined in this</p> <p>2 document, 119, right?</p> <p>3 A. That's right.</p> <p>4 Q. But in the right-hand column</p> <p>5 corresponding to term number 22 there's a</p> <p>6 statement that says see term 23 herein. Do</p> <p>7 you see that?</p> <p>8 A. Yes.</p> <p>9 Q. Now, do you understand that to mean</p> <p>10 that the definition of claim number 22 is the</p> <p>11 same as the definition of term number 23?</p> <p>12 A. I understand it to mean that it's</p> <p>13 either the same or that you need to refer to</p> <p>14 term number 23 to understand 22.</p> <p>15 Q. Okay. Well, let's look at number 23.</p> <p>16 Number 23 includes the phrase applying the</p> <p>17 fertilizer composition. Do you see that?</p> <p>18 A. Yes.</p> <p>19 Q. Now, if a fertilizer composition is</p> <p>20 applied to a plant, would that be the same as</p> <p>21 maintaining contact between the rhizosphere of</p> <p>22 the plant and the composition, as mentioned in</p> <p>23 term number 22?</p> <p>24 A. I'm pausing because I don't quite</p> <p>25 understand number 22. So maintaining contact</p>	<p style="text-align: right;">64</p> <p>1 understand those two.</p> <p>2 Q. Right. Okay. That's -- and that's</p> <p>3 how I understand it too. If I -- you</p> <p>4 mentioned that the rhizosphere is the physical</p> <p>5 zone right around the root, the zone of</p> <p>6 influence for the root. If I take a</p> <p>7 fertilizer composition and bury it or spread</p> <p>8 it 2 feet from the root, even though I'm</p> <p>9 possibly applying it, I'm certainly applying</p> <p>10 it to the ground, I'm not doing anything that</p> <p>11 would maintain contact between that fertilizer</p> <p>12 composition and the rhizosphere, right?</p> <p>13 MR. SCHULTZ: Objection to form.</p> <p>14 THE WITNESS: Unless -- that's</p> <p>15 correct, unless the roots are there. And</p> <p>16 that's why fertilizers are applied where the</p> <p>17 seeds are or the area where the roots are or</p> <p>18 will be.</p> <p>19 BY MR. ELLIOTT:</p> <p>20 Q. So if I apply it to the area right</p> <p>21 around the root zone, that would maintain</p> <p>22 contact -- that would be maintaining contact</p> <p>23 with -- between the composition and the root</p> <p>24 zone or the rhizosphere?</p> <p>25 A. That would be one way to do that, yes.</p>

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17 (Pages 65 to 68)

<p style="text-align: right;">65</p> <p>1 Q. But then if I dug it up five seconds 2 later, I wouldn't be maintaining contact for 3 sufficient time for it to cause an increase in 4 the yield of the plant, right? 5 A. That's right. So in that case it 6 would not be logical to expect there would be 7 a yield increase five minutes after you 8 applied it. 9 Q. But if I leave it there for a full 10 growing cycle, then I would expect it to be 11 maintaining contact for a time sufficient to 12 cause an increase in the yield of the plant. 13 A. That's my understanding too. 14 Q. Okay. Let me look to term number 24. 15 A. Okay. 16 Q. And that's on Page 42. And this is, 17 again, defined in the right-hand column in 18 terms of plant yield, which we discussed. I 19 think that's term number 20. Here the phrase 20 "sufficient amount of a fertilizer 21 composition" is defined as enough fertilizer 22 to cause a measurable increase in plant yield, 23 right? 24 A. Yes. 25 Q. And we earlier defined plant yield as</p>	<p style="text-align: right;">67</p> <p>1 defendants' column as same as sufficient 2 amount, true? 3 A. Yes. 4 Q. And do you agree that the definition 5 of effective amount is the same as the 6 definition of sufficient amount? 7 A. Yes, to me they are the same. 8 Q. And then I see in claim number -- 9 claim term number 26, spanning Pages 44 to 45, 10 the phrase effective amount is put in a 11 context of fertilizer composition, so term 12 number 26 is effective amount of a fertilizer 13 composition, right? 14 A. Yes. 15 Q. And that's defined as enough 16 fertilizer to cause a measurable increase in 17 plant yield, right? 18 A. Correct. 19 Q. And you agree with defendants' 20 proposed definition? 21 A. Yes, sir. 22 Q. Claim term number 27, that doesn't 23 refer to yield or nitrogen effect, but it does 24 talk about time sufficient to increase 25 something, and I'll just state it for the</p>
<p style="text-align: right;">66</p> <p>1 the amount of food harvested per unit area of 2 land, right? 3 A. Right. 4 Q. Now, is the increase in plant yield 5 something that is an amount of plant yield 6 that is compared to what the plant would yield 7 without the fertilizer composition? 8 A. Typically, when we measure yield, we 9 are comparing a treatment to a control, so it 10 would -- and I'm saying that because that's 11 the fundamental basis of comparison. So it 12 depends what the question is that's being 13 asked in the particular test what the control 14 would be. 15 Q. Okay. When you read this, when you're 16 saying gosh, this is referring to increasing 17 the yield of a plant, what would be in your 18 mind the implied control or the implied 19 reference point? 20 A. When it's asking -- talking about here 21 a fertilizer, then my understanding would be 22 it would be that fertilizer compared to a 23 non-fertilizer -- a non-fertilized control. 24 Q. Okay. And then term number 25 is 25 effective amount, and that's defined in</p>	<p style="text-align: right;">68</p> <p>1 record. Term number 27 is time sufficient to 2 increase concentration of non-bacillus 3 beneficial organisms in the rhizosphere. Do 4 you see that? 5 A. Yes, I do. 6 Q. Now, let me ask you, we already talked 7 about rhizosphere, so that's a term that's 8 well understood to persons of ordinary skill 9 in the art, right? 10 A. That's correct. 11 Q. And the word bacillus is a term that's 12 understood by persons of ordinary skill in the 13 art? 14 A. That's correct. 15 Q. Right. Then we look at the first part 16 of the phrase, term number 27, it says time 17 sufficient to increase concentration of 18 non-bacillus beneficial organisms in the 19 rhizosphere, and that starts with the phrase 20 time sufficient, right? 21 A. Yes. 22 Q. Yeah, let me break that down. Now, 23 we've already used the word time sufficient in 24 one of the other claims to refer to the amount 25 of time that a composition is next to the</p>

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18 (Pages 69 to 72)

<p style="text-align: right;">69</p> <p>1 plant, that time being defined as the time</p> <p>2 between when it's applied next to the</p> <p>3 rhizosphere and when the plant is harvested,</p> <p>4 right?</p> <p>5 A. Yes.</p> <p>6 Q. But that's in terms of yield.</p> <p>7 A. For yield, correct.</p> <p>8 Q. Now, in this case in term number 27 we</p> <p>9 see the same phrase, "time sufficient," right?</p> <p>10 A. Yes.</p> <p>11 Q. But in this case instead of increasing</p> <p>12 yield, the term is referring to increasing the</p> <p>13 concentration of something, right?</p> <p>14 A. Yes.</p> <p>15 Q. And the something that it's referring</p> <p>16 to is non-bacillus beneficial organisms,</p> <p>17 right?</p> <p>18 A. Organisms in the rhizosphere --</p> <p>19 Q. In the rhizosphere.</p> <p>20 A. -- specifically.</p> <p>21 Q. So we see that this term is referring</p> <p>22 to the increase of the concentration of</p> <p>23 something in that root zone, that zone of</p> <p>24 influence next to the plant, right?</p> <p>25 A. Yes.</p>	<p style="text-align: right;">71</p> <p>1 of those. Why is the word organism in the</p> <p>2 context of term 27 ambiguous?</p> <p>3 A. Because organism -- it doesn't say</p> <p>4 microorganism, and therefore organisms would</p> <p>5 include earthworms, insects. There's</p> <p>6 microarthropods, which are small microscopic</p> <p>7 insects that are common. There are nematodes,</p> <p>8 free living, and plant parasitic nematodes.</p> <p>9 Free living nematodes are in most root zones</p> <p>10 and are important so -- and there's all kinds</p> <p>11 of microorganisms also.</p> <p>12 So that's why it's ambiguous to me, because</p> <p>13 do they really mean all the organisms or do</p> <p>14 they mean specifically microorganisms?</p> <p>15 Q. Okay. If you -- and a microorganism</p> <p>16 can be either a bacteria or a fungi, right?</p> <p>17 A. In the broadest sense, yes. There are</p> <p>18 some other divisions, but those are the main</p> <p>19 ones.</p> <p>20 Q. Okay. So in this case the word</p> <p>21 organisms is very broad.</p> <p>22 A. Correct.</p> <p>23 Q. Now, does the word -- you said the</p> <p>24 word beneficial is ambiguous.</p> <p>25 A. Correct.</p>
<p style="text-align: right;">70</p> <p>1 Q. And the thing that is being increased</p> <p>2 in concentration is referred to here as</p> <p>3 non-bacillus beneficial organisms, right?</p> <p>4 A. Correct.</p> <p>5 Q. Now, there's no ambiguity over what an</p> <p>6 organism is in a rhizosphere, right?</p> <p>7 A. Actually, there is --</p> <p>8 Q. Okay.</p> <p>9 A. -- to me.</p> <p>10 Q. Okay. Well, let's back up then and go</p> <p>11 through this a word at a time, and help me</p> <p>12 understand --</p> <p>13 A. Okay.</p> <p>14 Q. -- which term in your mind is</p> <p>15 ambiguous, okay. Is the word organism</p> <p>16 ambiguous?</p> <p>17 A. Yes.</p> <p>18 Q. Is the word beneficial ambiguous?</p> <p>19 A. Yes.</p> <p>20 Q. Is the word non-bacillus ambiguous?</p> <p>21 A. Yes.</p> <p>22 Q. Is the word concentration ambiguous in</p> <p>23 the context of this term?</p> <p>24 A. Slightly.</p> <p>25 Q. Okay. Let me go back through each one</p>	<p style="text-align: right;">72</p> <p>1 Q. Why is it ambiguous?</p> <p>2 A. Well, I would ask somebody that came</p> <p>3 with this term, say what do you mean? What is</p> <p>4 beneficial? There are all kinds of ways of</p> <p>5 measuring benefit. It doesn't specify if it's</p> <p>6 increasing plant growth, if it's -- it can be</p> <p>7 beneficial by reducing plant stress. They</p> <p>8 might have no change in plant growth or yield</p> <p>9 under normal conditions, but under stressed</p> <p>10 conditions that's been described in the</p> <p>11 literature -- scientific literature generally</p> <p>12 as a benefit.</p> <p>13 So benefit is just a huge category of</p> <p>14 something better, but what is the something?</p> <p>15 Better to the plant? Better to the yield?</p> <p>16 Better to insects? Better to environment?</p> <p>17 It's just a very open concept.</p> <p>18 Q. So it's just very broad?</p> <p>19 A. Yes.</p> <p>20 Q. Okay. Are actinomycetes types of</p> <p>21 beneficial organisms?</p> <p>22 A. Actinomycetes are types of</p> <p>23 microorganisms.</p> <p>24 Q. Okay. And are there cases where those</p> <p>25 would be beneficial?</p>

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19 (Pages 73 to 76)

<p style="text-align: right;">73</p> <p>1 A. They are like the general bacteria in 2 that some are neutral, some are deleterious to 3 plants, and some are beneficial. 4 Q. Okay. And what about nitrogen fixing 5 bacteria, are those microorganisms? 6 A. I'm sorry, quote the term again. 7 Q. Nitrogen fixing bacteria. 8 A. Bacteria specifically. Yes, nitrogen 9 fixing bacteria are microorganisms. 10 Q. Okay. Are they beneficial to the 11 plant? 12 A. They often are; not all are. 13 Q. Okay. So using the word beneficial to 14 modify actinomycetes would limit the number 15 of – or the type of actinomycetes? 16 A. It would limit it, but it would still 17 create the confusion of what do you mean by 18 beneficial? How do we measure that? 19 Q. Okay. And how do you interpret the 20 word concentration? Would concentration of – 21 well, let me ask you this: If you consider 22 microorganisms, and specifically 23 microorganism – microorganisms in the 24 rhizosphere, is the concentration of 25 microorganisms ever evaluated?</p>	<p style="text-align: right;">75</p> <p>1 buckets of the same microorganisms around the 2 area of the plant, right? 3 A. Yes. 4 Q. So my question is, is the 5 concentration of microorganisms around plant 6 number two greater than the concentration of 7 microorganisms around plant number one? 8 A. The applied concentration immediately 9 at the time of application would be higher. 10 Q. Okay. At that time? 11 A. At that time. 12 Q. So in number 27 the concentration is 13 described as the concentration of non-bacillus 14 beneficial organisms, right? 15 A. Right. 16 Q. So it's a certain type of organisms 17 around the rhizosphere? 18 A. According to that term. 19 Q. Yes, yes, I'm just working with this 20 term. 21 A. Yes. 22 Q. And the term says that the 23 concentration of those microorganisms increase 24 or increases after a period of time, right? 25 A. That's what I'm not sure of, and</p>
<p style="text-align: right;">74</p> <p>1 A. Is it ever evaluated when? 2 Q. Is it ever measured? In other words, 3 let's just say that – maybe a rough 4 measurement. If I put a bucket of 5 microorganisms next to a rhizosphere in one 6 experiment and then a plant right next to it I 7 put two buckets of microorganisms next to the 8 plant, would the concentration of 9 microorganisms in the two bucket test be 10 greater than the concentration of 11 microorganisms in the one bucket test? 12 A. Okay. Let me make sure I understand 13 the question. So in that test you mean you're 14 applying one or two buckets? 15 Q. Well, I've got two plants. 16 A. Okay. 17 Q. Let's just say they're 10 yards apart, 18 and next to plant number one I put one bucket 19 of microorganisms. 20 A. Do you mean next to it? Do you mean 21 you apply that to the plant? 22 Q. Right, next to the area around the 23 plant. 24 A. Oh, I understand. Okay. 25 Q. And then plant number two I apply two</p>	<p style="text-align: right;">76</p> <p>1 that's why I have this confusion. 2 Concentration is typically used in the context 3 that you described in your previous question, 4 the application, concentration of a product, 5 concentration of an active ingredient, but 6 here they're talking about I think – this is 7 where I'm confused when I read this, because 8 what do they mean concentration, to increase 9 population, population density? I don't know 10 what they mean by concentration; in other 11 words, how we would measure that. I'm 12 thinking as a microbiologist how we would 13 measure it. 14 Q. In the application example how would 15 you measure the concentration? 16 A. You would take bucket number one and 17 bucket number two before you applied them and 18 you would do a plate count to determine 19 actually what the population was in the 20 bucket. 21 Q. Okay. Could you also make it as the 22 concentration of the microorganisms as a 23 percentage or proportion of the grams of the 24 soil? 25 A. That would be a way to determine after</p>

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20 (Pages 77 to 80)

<p style="text-align: right;">77</p> <p>1 it's applied, but that wouldn't be a 2 concentration in the product. 3 Q. Right. And that's what I'm thinking 4 of. I'm thinking since this concentration is 5 referring to concentration in the rhizosphere, 6 the rhizosphere includes soil, right? 7 A. You could do that. The nature of my 8 confusion over this and why to me this is an 9 ambiguous term is because concentration is 10 used in that way -- can be used in that way, 11 but the general term that's clear is 12 population. 13 Q. Okay. And population meaning the 14 count? 15 A. The count, how many of the living 16 cells of the organism that you're testing, 17 which I'm not sure what it is here, how many 18 of those you recover in a plant count. 19 Q. Okay. And is that -- in a dry 20 composition is that done -- let me back up and 21 we'll talk about this a little bit. But it's 22 the count in the context of the grams or the 23 weight of the material that it populates, 24 right? 25 A. Are we -- I'm a little confused. Is</p>	<p style="text-align: right;">79</p> <p>1 microorganisms in the rhizosphere, the 2 rhizosphere includes not just plant structure, 3 but it's really the soil around the 4 rhizosphere, which can be expressed in terms 5 of grams, right? 6 A. Correct. 7 Q. And if the concentration in the 8 rhizosphere is referenced here, then the 9 denominator could very well be grams of soil. 10 A. Yes, it could be. 11 Q. And the numerator could be the counts 12 of these bacteria per grams of soil. 13 A. But that's the challenge, the counts 14 of these bacteria, and which ones? So we have 15 to have a way of counting them, and we cannot 16 count beneficial non-bacillus organisms. 17 Q. Unless we know what those are. I 18 mean, if you know what the bacteria are, then 19 you can count them, right? 20 A. And there -- yes, you could, but there 21 is no way of knowing that in advance, so you 22 can't count something that you don't know. 23 Q. Right. So you'd have to take a sample 24 of soil and test it. You'd know how many 25 grams of soil you've got, and then you would</p>
<p style="text-align: right;">78</p> <p>1 that -- are we talking about in the soil here, 2 then, in this case? 3 Q. That's exactly right. That's why I'm 4 -- I'm trying to arrive at a denominator. You 5 know, it's like in liquids you do it in terms 6 of milliliters, in solids you do the 7 concentration in terms of grams. 8 A. That's right. Typically it would be 9 the pop -- if we're talking population, I 10 would prefer to see this as population, it 11 would be the population per gram of soil, for 12 example -- 13 Q. Okay. 14 A. -- or per gram of root, excuse me. 15 Q. Right. So it would be a numerator 16 over a denominator, and that would be a 17 concentration? 18 A. Correct. 19 Q. So the denominator in this case would 20 be some weight unit? 21 A. Right. 22 Q. Because we're talk -- 23 A. Or it can be a plant unit, volume or 24 -- yeah. But typically it's a weight. 25 Q. And if we're talking about</p>	<p style="text-align: right;">80</p> <p>1 test it to arrive at how many counts of that 2 particular bacteria. 3 A. If it's a particular bacteria, but in 4 this case it's not. It's not a described 5 group. 6 Q. Right. But I'm just -- assuming you 7 know what the bacteria is, then there's a 8 protocol that you could follow to count that 9 bacteria. 10 A. That's correct. 11 Q. And if that bacteria increased when 12 compared to a reference fertilizer, which is 13 non fertilizer, then you would know there was 14 an increase. 15 A. That's correct. 16 Q. Okay. You refer to term numbers 8 17 through 11. 18 A. Are we on the same document? 19 Q. Yes. 20 A. Oh, I'm sorry. 21 Q. Let's stay in Exhibit 119 -- 22 A. Okay. 23 Q. -- term numbers 8 through 11. Let's 24 start with term number 8. 25 A. Okay.</p>

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21 (Pages 81 to 84)

<p style="text-align: right;">81</p> <p>1 Q. And I'll just refer to these as 2 specific bacillus, and that would be 8, 9, 10 3 and 11 are four different specific bacillus 4 examples, right? 5 A. Yes. 6 Q. And your testimony is this is a -- 7 each one of these terms, the bacillus examples 8 here, is specifically limited to a particular 9 strain, is that right? 10 A. Yes. 11 Q. And that it doesn't broadly cover the 12 species but, rather, the sub species, which is 13 the strain. 14 A. That's correct. 15 Q. And I want to refer back to your 16 earlier testimony. You had talked about 17 particular types of rhizobacteria, and I think 18 you used the phrase, if I can find it, PG -- 19 is it PG RP? 20 A. PGPR. 21 Q. PGPR. I'll get it right. PGPR is a 22 growth-enhancing type of rhizobacteria. 23 A. Right. 24 Q. Are each one of these bacillus 25 examples examples of growth-enhancing</p>	<p style="text-align: right;">83</p> <p>1 same way. So there are bacillus subtilis that 2 colonize teeth, colonize human skin, and you 3 put them in the soil and they will not 4 colonize roots. That gets into the issue of 5 what strains are. 6 So that's germane to your question about 7 are these all rhizobacteria? I can't say they 8 are because it depends on each specific 9 strain, which is only determined in 10 experimental tests. 11 Q. Okay. So just because you refer to 12 bacillus laterosporus doesn't mean that every 13 bacillus laterosporus is going to enhance the 14 growth of plants. 15 A. That's right. 16 Q. And therefore, all bacillus 17 laterosporus is not going to be a 18 rhizobacteria. 19 A. I agree with everything up until that 20 last -- the end of that. 21 Q. Maybe I need to go back and -- the 22 word rhizobacteria is a very broad term, 23 right? 24 A. Right. That means, yes, the root 25 colonizing. So it's correct that you can't</p>
<p style="text-align: right;">82</p> <p>1 rhizobacteria? 2 A. I'm not sure the question. Each of 3 these, what are these? 4 Q. I'm looking at -- term numbers 8 5 through 11 are four different -- I think your 6 position is these are four different 7 strains -- 8 A. Right. 9 Q. -- of bacillus bacteria. There's two 10 versions of bacillus laterosporus; there's 11 bacillus subtilis, and there's bacillus 12 licheniformis. Did I say that right? 13 A. That's close enough. 14 Q. Are these examples -- are these all 15 examples of rhizobacteria in the broadest 16 sense? 17 A. That's a good question. The reason 18 I'm pausing is because rhizobacteria, as we 19 said, was the ability to grow on roots, build 20 a population. 21 Q. Right. 22 A. If we read, say, in the literature 23 that bacillus subtilis strain A was used in a 24 study and colonized roots, that doesn't mean 25 that all bacillus subtilis will behave the</p>	<p style="text-align: right;">84</p> <p>1 predict that all strains of a species will be 2 root colonizers. 3 Q. Right. 4 A. You also cannot predict that all 5 strains will be the beneficial root 6 colonizers, plant growth promoting. So even 7 if they colonize roots, they might -- still 8 might not be beneficial. They could have 9 harmful effects from a plant, even within the 10 same species. So a bacillus laterosporus can 11 be described in the literature one strain as a 12 growth promoter, the good guys, PGPR, but you 13 could also find strains of bacillus 14 laterosporus that would colonize roots and 15 potentially have some harm. Just because an 16 organism colonizes roots doesn't mean that 17 it's going to be a good organism. 18 Q. Sure. So -- 19 THE VIDEOGRAPHER: Pardon me. I'm 20 sorry. 21 MR. ELLIOTT: Okay, let's take a 22 break. 23 THE VIDEOGRAPHER: This is the end 24 of tape number one in the deposition of Joseph 25 Kloepper. The time is 11:23 a.m. We're now</p>

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22 (Pages 85 to 88)

<p style="text-align: right;">85</p> <p>1 off the record.</p> <p>2 (Brief recess).</p> <p>3 THE VIDEOGRAPHER: This is the</p> <p>4 beginning of tape number two in the deposition</p> <p>5 of Joseph Kloepper. The time is 11:36 a.m.</p> <p>6 We are back on the record.</p> <p>7 BY MR. ELLIOTT:</p> <p>8 Q. Mr. Kloepper, just to follow up on our</p> <p>9 last series of questions, would it be true</p> <p>10 that bacillus laterosporus referenced in claim</p> <p>11 term number 8 in Exhibit 119 is a</p> <p>12 rhizobacteria?</p> <p>13 A. Some strains of bacillus laterosporus</p> <p>14 are rhizobacteria, not all strains are, so I</p> <p>15 could not make that broad comment.</p> <p>16 Q. Okay. And that would likewise be true</p> <p>17 for bacillus licheniformis, number 10?</p> <p>18 A. Yes.</p> <p>19 Q. And bacillus subtilis, number 11?</p> <p>20 A. Yes.</p> <p>21 Q. So all the bacteria that's identified</p> <p>22 in the patent -- the patents in this case are</p> <p>23 such that some members of those species can be</p> <p>24 considered rhizobacteria but not all of them?</p> <p>25 MR. SCHULTZ: Objection to form.</p>	<p style="text-align: right;">87</p> <p>1 bacillus mentioned doesn't mean it's going to</p> <p>2 benefit the plant.</p> <p>3 A. That's correct.</p> <p>4 Q. And in fact, just if you see bacillus</p> <p>5 laterosporus mentioned doesn't mean it's going</p> <p>6 to benefit the plant.</p> <p>7 A. That's correct.</p> <p>8 Q. Are there publications that identify</p> <p>9 the types of bacillus laterosporus or bacillus</p> <p>10 licheniformis or bacillus subtilis that are</p> <p>11 beneficial to plant growth?</p> <p>12 A. I'm pausing because the -- there's not</p> <p>13 a way to predict which ones are; in other</p> <p>14 words, as I was mentioning before, one has to</p> <p>15 take a strain, apply it to a plant and see</p> <p>16 what the effect is. Typically then scientists</p> <p>17 write those results up so you will see a</p> <p>18 publication on a particular strain.</p> <p>19 In all the conferences and international</p> <p>20 PGPR meetings that I've attended no one has</p> <p>21 ever tried to compile a list of all specific</p> <p>22 strains of a species to say what are the</p> <p>23 factors that make a strain -- one strain</p> <p>24 beneficial and other strains not.</p> <p>25 Q. But there is literature out there that</p>
<p style="text-align: right;">86</p> <p>1 MR. ELLIOTT: Okay, I'll rephrase.</p> <p>2 BY MR. ELLIOTT:</p> <p>3 Q. Let me talk about the -- now, just a</p> <p>4 quick review. You said that PGR -- PGRP -- or</p> <p>5 PGPR is a certain type of rhizobacteria.</p> <p>6 A. Correct.</p> <p>7 Q. Okay. Rhizobacteria generally is any</p> <p>8 bacteria that is root colonizing?</p> <p>9 A. That's right.</p> <p>10 Q. But plant growth promoting</p> <p>11 rhizobacteria are a form of rhizobacteria that</p> <p>12 are not only root colonizing, but also</p> <p>13 increase the growth of a plant, is that right?</p> <p>14 A. That's right.</p> <p>15 Q. And that includes their tendency to</p> <p>16 increase the actual growth of the plant or to</p> <p>17 protect the plant from something bad happening</p> <p>18 to it, is that right?</p> <p>19 A. That's right.</p> <p>20 Q. Okay. And is it your testimony that</p> <p>21 bacillus in general can be rhizobacteria but</p> <p>22 not necessarily?</p> <p>23 A. Some species of bacillus and some</p> <p>24 strains of those species can be.</p> <p>25 Q. Right. So just because you see</p>	<p style="text-align: right;">88</p> <p>1 at least identifies the strain that will be a</p> <p>2 PGPR?</p> <p>3 A. There are many publications talking</p> <p>4 about individual strains as PGPR.</p> <p>5 Q. And have you ever identified any</p> <p>6 individual strains of bacillus that qualify as</p> <p>7 PGPR?</p> <p>8 A. Yes.</p> <p>9 Q. And are some of those listed in your</p> <p>10 publications?</p> <p>11 A. Yes.</p> <p>12 Q. And are some of them listed in your</p> <p>13 patents -- one or more of your patents?</p> <p>14 A. Yes.</p> <p>15 Q. Okay. Let me refer now to term number</p> <p>16 14 in Exhibit 119.</p> <p>17 A. Which page is that?</p> <p>18 Q. That's page number 27.</p> <p>19 A. Okay.</p> <p>20 Q. And I'm going to look at terms 14, 15,</p> <p>21 16, 17 and 18 together as a cluster of terms</p> <p>22 that are related to one another. And I'd like</p> <p>23 to start out with term number 14. Term number</p> <p>24 14 is probiotic bacillus bacteria. Do you see</p> <p>25 that?</p>

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25 (Pages 97 to 100)

<p style="text-align: right;">97</p> <p>1 BY MR. ELLIOTT:</p> <p>2 Q. Well, I'm just trying to -- I'm trying</p> <p>3 to piece together something. In term 15, see,</p> <p>4 it doesn't say -- it doesn't have a</p> <p>5 definition, it just refers to two other terms.</p> <p>6 Do you see that on Page 28? And I'm trying to</p> <p>7 piece these together the right way. I -- so</p> <p>8 first of all, it refers to term number 14,</p> <p>9 which we talked about probiotic bacillus</p> <p>10 bacteria. Then it talks about this enhancing</p> <p>11 the beneficial populations within a</p> <p>12 rhizosphere of a plant. So I go to 16, I see</p> <p>13 that another way in the definition of the</p> <p>14 rhizosphere of the plant is in the root zone</p> <p>15 of a plant. That's how I understood it, and I</p> <p>16 just wanted to confirm that that's why that</p> <p>17 appeared in the definition.</p> <p>18 MR. SCHULTZ: Objection to form.</p> <p>19 BY MR. ELLIOTT:</p> <p>20 Q. Okay. Why did -- I'll ask it this</p> <p>21 way: In term number 16 why was the phrase</p> <p>22 capable of enhancing beneficial microbial</p> <p>23 populations defined in terms of the root zone</p> <p>24 of a plant?</p> <p>25 A. To me it's reflective of what happens</p>	<p style="text-align: right;">99</p> <p>1 within a rhizosphere of a plant, so shouldn't</p> <p>2 the definition also be directed specifically</p> <p>3 to the rhizosphere of the plant; that is, the</p> <p>4 subpart of the root zone?</p> <p>5 A. I don't know if it should.</p> <p>6 Q. Well, let me ask this again. Would it</p> <p>7 be accurate to -- let's turn to the phrase --</p> <p>8 I'll ask a new question. Referring to term</p> <p>9 number 16, do you see the phrase enhancing</p> <p>10 beneficial microbial populations?</p> <p>11 A. Yes.</p> <p>12 Q. And that's defined as promoting the</p> <p>13 growth and reproduction of other beneficial</p> <p>14 microbes, right?</p> <p>15 A. Uh-huh.</p> <p>16 Q. So the phrase microbial populations is</p> <p>17 defined as microbes, right? I'm trying to</p> <p>18 connect the dots. I'm trying --</p> <p>19 A. Try that last question again.</p> <p>20 Q. Okay. I'm just -- I see in the</p> <p>21 definition on Page 30, definition of term</p> <p>22 number 16, there's the phrase other beneficial</p> <p>23 microbes, and my question is does that phrase</p> <p>24 correspond to the part of term number 16,</p> <p>25 beneficial microbial populations?</p>
<p style="text-align: right;">98</p> <p>1 in soil microbiology in the field. Let me</p> <p>2 explain. The -- we're talking here, this</p> <p>3 claim, as I understand it, capable of</p> <p>4 enhancing beneficial microbial populations, is</p> <p>5 referring to organisms in the soil, not the</p> <p>6 ones that are applied, native microorganisms.</p> <p>7 Native microorganisms that cause benefits</p> <p>8 to a plant reside or live not only in the</p> <p>9 rhizosphere but -- because we -- the</p> <p>10 rhizosphere is a narrow zone, I to 2</p> <p>11 millimeters, but they can be removed from that</p> <p>12 -- other places and still cause some of the</p> <p>13 benefits that are talked about in the patent.</p> <p>14 So it's a more precise way of stating what the</p> <p>15 effect is,</p> <p>16 Q. Okay. So just to make sure I</p> <p>17 understand, the root zone of a plant is</p> <p>18 broader in scope, size, than the rhizosphere</p> <p>19 of a plant?</p> <p>20 A. That's correct.</p> <p>21 Q. So the rhizosphere is a subpart of the</p> <p>22 root zone?</p> <p>23 A. That's correct.</p> <p>24 Q. Okay. But the -- you know, not to</p> <p>25 quibble, but term number 15 specifically says</p>	<p style="text-align: right;">100</p> <p>1 A. So does the term other beneficial</p> <p>2 microbes under the column defendants, is that</p> <p>3 the same as beneficial microbial populations</p> <p>4 in the first column?</p> <p>5 Q. Yes, that's my question.</p> <p>6 A. I understand that to be the case.</p> <p>7 Q. Okay. So the word enhancing in term</p> <p>8 number 16 is referring to promoting the growth</p> <p>9 and reproduction?</p> <p>10 A. That was my understanding too.</p> <p>11 Q. Okay. So put that together in term</p> <p>12 number 16, enhancing beneficial microbial</p> <p>13 populations means promoting the growth and</p> <p>14 reproduction of other beneficial microbes.</p> <p>15 A. That's the way I understand it.</p> <p>16 Q. And just based on your reading of the</p> <p>17 patent, those other beneficial microbes are</p> <p>18 not the microbes that are being added as part</p> <p>19 of the fertilizer composition, right?</p> <p>20 A. That's my understanding.</p> <p>21 Q. They are microbes that exist in the</p> <p>22 soil prior to the application of the</p> <p>23 fertilizer composition.</p> <p>24 A. Yes.</p> <p>25 Q. Now, according to the language of term</p>

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36 (Pages 141 to 144)

<p style="text-align: right;">141</p> <p>1 lab records.</p> <p>2 Q. Okay. So when you took the count, did</p> <p>3 you count spores of other non-bacillus</p> <p>4 bacteria?</p> <p>5 A. What we did was we took a sample of</p> <p>6 the product and made a series of dilutions and</p> <p>7 we plated each of those onto an agar that</p> <p>8 would allow any bacteria to grow, and so we</p> <p>9 recorded the count of what grew up.</p> <p>10 Now, what would grow up would be organisms</p> <p>11 that were in the product as spores or as</p> <p>12 vegetative cells.</p> <p>13 Q. Okay. So it was a plate count?</p> <p>14 A. It was a plate count.</p> <p>15 Q. But not specifically a spore count?</p> <p>16 A. That's correct.</p> <p>17 Q. The definition here of term number 7,</p> <p>18 looking at the bottom of Page 14, says the</p> <p>19 fertilizer must include enough spores that are</p> <p>20 capable of germinating back into bacillus</p> <p>21 bacteria. Do you see that?</p> <p>22 A. Uh-huh.</p> <p>23 Q. Now, when you say germinating back</p> <p>24 into bacillus bacteria, you mean back into</p> <p>25 vegetative bacillus, right?</p>	<p style="text-align: right;">143</p> <p>1 Do you see that?</p> <p>2 A. Yes, I do.</p> <p>3 Q. Now, do you agree, is it your opinion</p> <p>4 that that definition adequately describes or</p> <p>5 defines term number 7?</p> <p>6 A. Yes.</p> <p>7 Q. Now, term number 7 actually uses the</p> <p>8 phrase viable spore count, right?</p> <p>9 A. Uh-huh.</p> <p>10 Q. Viable means alive.</p> <p>11 A. Capable of growing.</p> <p>12 Q. Capable of growing?</p> <p>13 A. Yeah.</p> <p>14 Q. Now, a spore -- if a spore -- a spore</p> <p>15 is always viable, right, or else it would be</p> <p>16 dead?</p> <p>17 A. But it would appear the same if you</p> <p>18 look at a spore. The only way to know is if</p> <p>19 you try to grow it.</p> <p>20 Q. Right, because it's dormant.</p> <p>21 A. Right.</p> <p>22 Q. But a viable spore count means a spore</p> <p>23 that's capable of growing into vegetative form</p> <p>24 -- or let me rephrase that. A viable spore is</p> <p>25 a spore that is capable of growing into</p>
<p style="text-align: right;">142</p> <p>1 A. Yes, that's right.</p> <p>2 Q. And in fact, in the plate count test</p> <p>3 or the spore count test that's what a colony</p> <p>4 forming unit is, right?</p> <p>5 A. Yes. A colony forming unit is a</p> <p>6 measure of viable cells.</p> <p>7 Q. Right. So it's -- when you see a</p> <p>8 colony forming unit, you know that at that</p> <p>9 moment that bacteria is in vegetative form and</p> <p>10 not in spore form.</p> <p>11 A. The colony itself?</p> <p>12 Q. Yes, at the time that you see it or it</p> <p>13 forms. It might have used to have been a</p> <p>14 spore, but when you measure it, it's no longer</p> <p>15 a spore.</p> <p>16 A. That's correct.</p> <p>17 Q. Because it's germinating and it's now</p> <p>18 in vegetative form, right?</p> <p>19 A. Yes.</p> <p>20 Q. The definition further says to create</p> <p>21 between 10 to the 6th to 10 to the 9th colony</p> <p>22 forming units per gram of fertilizer --</p> <p>23 A. Right.</p> <p>24 Q. -- right? And then it says, "A colony</p> <p>25 forming unit is a live reproducing bacteria."</p>	<p style="text-align: right;">144</p> <p>1 vegetative form?</p> <p>2 A. A viable spore --</p> <p>3 Q. A viable spore is a spore that is</p> <p>4 capable of germinating into vegetative form?</p> <p>5 A. That's correct. Right.</p> <p>6 Q. In this case there's a reference in</p> <p>7 term number 7 to spore count, right?</p> <p>8 A. Yeah, viable spore count. Yes.</p> <p>9 Q. And the spore count is expressed as</p> <p>10 cfu's per gram of composition, right?</p> <p>11 A. Yes.</p> <p>12 Q. A cfu is a colony forming unit.</p> <p>13 A. That's correct.</p> <p>14 Q. A colony forming unit is in</p> <p>15 vegetative, not spore, form.</p> <p>16 A. When you're counting it, correct.</p> <p>17 Q. Yes. So when you count colony forming</p> <p>18 units, you are inferentially counting the</p> <p>19 number of spores.</p> <p>20 A. That's correct.</p> <p>21 Q. And in order to make sure that</p> <p>22 whatever you're counting was before</p> <p>23 germination on the agar plate spore, you have</p> <p>24 to kill the vegetative cells first, right?</p> <p>25 A. Right.</p>

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37 (Pages 145 to 148)

<p style="text-align: right;">145</p> <p>1 Q. And is that the procedure that's</p> <p>2 described in the plaintiffs' column?</p> <p>3 A. On Page 15?</p> <p>4 Q. Yes. And maybe we could read through</p> <p>5 this step by step, and I just want you to tell</p> <p>6 me if any of these statements are -- are</p> <p>7 inaccurate.</p> <p>8 Beginning on Page 14, "The bacillus spores</p> <p>9 in the fertilizer composition are present in</p> <p>10 an amount such that measurement according to</p> <p>11 the spore count procedure in the patent</p> <p>12 results in a viable spore count between 10 to</p> <p>13 the 6th and 10 to the 9th colony-forming</p> <p>14 units, cfu, per gram of the dry fertilizer</p> <p>15 composition." Is that an accurate statement?</p> <p>16 A. Yes.</p> <p>17 Q. Then the next statement is "The spore</p> <p>18 count procedure in the patent includes heating</p> <p>19 a sample of the dry fertilizer composition for</p> <p>20 10 minutes at 80 degrees centigrade to kill</p> <p>21 non-spore forming bacteria and then incubating</p> <p>22 the sample aerobically for 48 hours to recover</p> <p>23 only bacillus." Is that a true statement?</p> <p>24 A. It is -- yes and no. It's true in</p> <p>25 that this is one method. There is not a</p>	<p style="text-align: right;">147</p> <p>1 hours. And the temperature does not have to</p> <p>2 be 32. You can make spore counts as fast as</p> <p>3 24. It depends -- 24 hours depending on the</p> <p>4 strain. So there's variability in the precise</p> <p>5 methods.</p> <p>6 Q. Okay. But at any rate, this does</p> <p>7 explain what the claim term says, that a spore</p> <p>8 count is identified in terms of cfu's per</p> <p>9 gram.</p> <p>10 A. It explains one way to do spore</p> <p>11 counts, yes.</p> <p>12 Q. Right. But universally, a spore count</p> <p>13 refers to the colony forming units that have</p> <p>14 formed that are in vegetative form.</p> <p>15 A. Following a heat treatment, correct.</p> <p>16 Q. Yes. And there's a heat treatment --</p> <p>17 the purpose of a heat treatment is to make</p> <p>18 sure that every colony forming unit used to be</p> <p>19 a spore before it was subjected to the</p> <p>20 measurement test.</p> <p>21 A. That's correct.</p> <p>22 MR. SCHULTZ: It's ten after 1:00,</p> <p>23 do you plan to break for lunch?</p> <p>24 MR. ELLIOTT: If you want a break,</p> <p>25 I'll break.</p>
<p style="text-align: right;">146</p> <p>1 single exact method. And my thinking is that</p> <p>2 this is very specific. More specifically, the</p> <p>3 general procedure is for 20 minutes, for</p> <p>4 example, instead of 10 minutes.</p> <p>5 Q. Okay. At a different temperature or</p> <p>6 it's usually 80 degrees?</p> <p>7 A. 80 is most common, anywhere from 80 to</p> <p>8 90.</p> <p>9 Q. Okay. But this is one way to measure</p> <p>10 the --</p> <p>11 A. It is one way, that's correct.</p> <p>12 Q. And then the final sentence says,</p> <p>13 "Bacillus spore counts are a measurement</p> <p>14 resulting from counting the total number of</p> <p>15 colony-forming units of the bacillus bacteria</p> <p>16 that have grown on a medium of tryptic soy</p> <p>17 agar after about 3 days, 72 hours of</p> <p>18 incubation, at 32 degrees centigrade." Is</p> <p>19 that a true statement?</p> <p>20 A. It's one way of doing it again.</p> <p>21 Q. Okay.</p> <p>22 A. But it doesn't have to be three days.</p> <p>23 In fact, just before that you see they refer</p> <p>24 to 48 hours. I was a little confused there</p> <p>25 why 48 and then three days. It switches 72</p>	<p style="text-align: right;">148</p> <p>1 MR. SCHULTZ: How much longer do</p> <p>2 you have?</p> <p>3 MR. ELLIOTT: I honestly don't</p> <p>4 know.</p> <p>5 MR. SCHULTZ: Well, an hour, two</p> <p>6 hours? I mean, it's kind of up to the</p> <p>7 witness. Do you want to break for lunch?</p> <p>8 THE WITNESS: Well, it kind of</p> <p>9 depends how much -- yeah, how much longer. If</p> <p>10 it's an hour, probably not.</p> <p>11 MR. ELLIOTT: It will probably be</p> <p>12 more than an hour. I mean, I'm just trying</p> <p>13 to -- I've been in depositions for --</p> <p>14 THE WITNESS: Can we have a short</p> <p>15 break?</p> <p>16 (Off-the-record discussion).</p> <p>17 THE VIDEOGRAPHER: The time is</p> <p>18 1:13 p.m. We're now off the record.</p> <p>19 (Lunch recess).</p> <p>20 THE VIDEOGRAPHER: The time is</p> <p>21 2:10 p.m. We're back on the record.</p> <p>22 BY MR. ELLIOTT:</p> <p>23 Q. Mr. Kloepper, can we look at Exhibit</p> <p>24 119, Page 25?</p> <p>25 A. One moment.</p>

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38 (Pages 149 to 152)

<p style="text-align: right;">149</p> <p>1 Q. That's the exhibit we've been 2 discussing. 3 A. Oh, it's the same one. Okay. Which 4 page again? 5 Q. Page 25. The term is humic acid, and 6 that's term number 12. 7 A. Yes. 8 Q. And my question is what is the 9 definition of humus? 10 A. Humus is decayed organic material, and 11 typically often in the general term of like 12 soil science the humus is the upper layer of 13 the soil that has this decaying plant 14 material. 15 Q. So it's any -- is it any plant 16 material decays and forms humus? 17 A. Well, lignin is one of the main 18 compounds plant cell walls break down, and 19 humic substances can include humus, humic acid 20 and another acid, folic acid. 21 Q. So is humus, humic acid, are those 22 different things? 23 A. They are different by some ways of 24 clustering these. I have read where people 25 clump humus together in the general category</p>	<p style="text-align: right;">151</p> <p>1 acid -- 2 A. That's correct. 3 Q. -- but not vice-versa? 4 A. That's correct. 5 Q. Okay. And all of it is considered 6 humic material? 7 A. Yeah, humic substances or humic 8 material. I've seen both of those terms. 9 Q. Okay. Now, a humate is a salt, 10 correct? 11 A. Yes. 12 Q. And it's the salt form of the humic 13 acid? 14 A. Correct. 15 Q. Do humates and humic acids coexist 16 typically in the same natural form? 17 A. To my understanding they do because 18 like most acid and salt situations, it depends 19 on the pH of the soil, how much acidity there 20 is, and what the form of the -- is 21 predominant, if it's the salt or the acid 22 form. 23 Q. So typically, and, as I recall, from 24 my chemistry 101, there's an equilibrium that 25 forms between the acid and the salt depending</p>
<p style="text-align: right;">150</p> <p>1 of humic substances and include humic acid as 2 another of the humic substances. But in the 3 general usage and the way that like soils by 4 science 101 is taught usually is humus is the 5 actual more recently decaying organic 6 material. That's the stuff that gardeners 7 want to put in their garden to have nice lumpy 8 soil. Humic acid is more of a specific 9 compound. 10 Q. Okay. Well, let me refer to the 11 definition of humic acid as proposed by 12 defendants in Exhibit 119. It states that 13 humic acid is an acid that is naturally 14 produced during the decomposition of organic 15 matter. Do you see that? 16 A. Yes, I do. 17 Q. Now, is humic acid a product of 18 decomposition after an extended period of time 19 or is it something that would fit under the 20 definition of humus that you just described? 21 A. Humic acid can come from humus, but it 22 can also come from organic materials that have 23 been for a long period of time, such as even 24 lignite and coal. 25 Q. Okay. So humus can turn into humic</p>	<p style="text-align: right;">152</p> <p>1 on the pH and other conditions. Is that 2 equilibrium true for humic acids and humates 3 as well? 4 A. I believe it is. I don't know why it 5 wouldn't be. 6 Q. Okay. Have -- well, let me refer you 7 to the patent -- the '179 patent. Do you have 8 that in front of you? 9 A. Yes. 10 Q. And I'll refer you first to column 1, 11 lines 6 through 15. Are you there? 12 A. 6 to 15, yes. 13 Q. I'm sorry, column 4. 14 A. Column 4. 15 Q. Column 4, lines 6 through 15. 16 A. Yes. 17 Q. And this portion of the patent states, 18 "As used herein, humic acid, in quotes, means 19 a polymeric compound typically containing the 20 brownish-black pigment melanin and can be 21 obtained from lignite." Do you see that? 22 A. Yes, I do. 23 Q. Is that consistent with your usage and 24 the usage of others of the term humic acid in 25 the fertilizer industry?</p>

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53 (Pages 209 to 212)

<p style="text-align: right;">209</p> <p>1 Q. And this -- in the context of a 2 fertilizer, the fact that the bacillus 3 bacteria is in the form of an endospore means 4 that it can exist in a dormant form and still 5 survive, right? 6 A. That's correct. 7 Q. And it's only when it gets into a -- 8 in the presence of nutrients that it starts to 9 multiply. 10 A. That's correct. 11 Q. And what you want is you want to have 12 a bacteria that stays dormant when you don't 13 want it to do anything and multiplies when you 14 want it to do something. 15 MR. SCHULTZ: Objection, vague. 16 MR. ELLIOTT: Okay, I'll rephrase 17 that. 18 BY MR. ELLIOTT: 19 Q. In the context of a fertilizer, you 20 want the bacteria to stay dormant when it's 21 not in a fertilizer application context, 22 right? 23 MR. SCHULTZ: Same objection. 24 BY MR. ELLIOTT: 25 Q. I mean, do you understand that a</p>	<p style="text-align: right;">211</p> <p>1 A. Okay. 2 Q. Are you there? 3 A. Uh-huh. 4 Q. Exhibit 119, Page 10, term number 4. 5 Are you there? 6 A. Yes. 7 Q. Could you read term number 4 for the 8 record? 9 A. Total aerobic/facultative viable plate 10 count. 11 Q. Okay. The definition, according to 12 plaintiffs on the next column over, is a 13 measurement resulting from counting the total 14 number of colony-forming units of both aerobic 15 bacteria and facultative bacteria that have 16 grown on a medium of tryptic soy agar after 17 about 3 days, parentheses, 72 hours, close 18 parentheses, of incubation at 32 degrees 19 centigrade. Do you see that? 20 A. Yes. 21 Q. Let me ask you, when you see the 22 phrase in term number 4 aerobic slash 23 facultative, do you understand that to mean 24 the aerobic viable plate count and the 25 facultative viable plate count?</p>
<p style="text-align: right;">210</p> <p>1 fertilizer is -- it's in the application 2 context when it's being applied to the plants, 3 right? 4 A. Yes. 5 Q. And pre application it might be 6 sitting in a warehouse somewhere. 7 A. Oh, I see. Yes. 8 Q. And so when it's in the warehouse, you 9 want it to be in a dormant state, right? 10 A. Correct. 11 Q. But when you apply it to the field, to 12 the plant, you want it to move from the 13 dormant state to a state where it's 14 multiplying and growing. 15 A. Yes. 16 Q. And that's part of why bacillus spores 17 are so helpful to the fertilizers, because 18 they allow you to have those two stages. 19 A. That's correct. 20 Q. Exhibit 120, Page 4, please. And this 21 page discusses testing to determine plate 22 counts, right? 23 A. That's correct. 24 Q. Let me ask you to put that Exhibit 120 25 to one side and refer to Exhibit 119.</p>	<p style="text-align: right;">212</p> <p>1 A. Yes. 2 Q. So it's the combination of the two, 3 it's the plate count of bacteria that are both 4 aerobic and facultative? 5 A. Correct. 6 Q. And facultative is shorthand for 7 facultative anaerobic? 8 A. That's right. 9 Q. In plaintiffs' definition of term 10 number 4 there's a reference to a very 11 specific test, right, a plate count test? 12 A. That's right. 13 Q. And that's similar to the spore count 14 test we discussed earlier, right? 15 A. Correct. 16 Q. Except the difference being that in 17 this case you don't heat it to 80 degrees 18 centigrade for 10 minutes to kill the 19 vegetative cells, right? 20 A. Right. 21 Q. So in this case you just test it 22 according to the plate count test, and in the 23 patent, at least in the specification, the 24 plate count test identifies the medium, which 25 is tryptic soy agar, the time, which is 72</p>

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<p style="text-align: right;">213</p> <p>1 hours, or 3 days, and the temperature, which 2 is 32 degrees centigrade, right? 3 A. Yes. 4 Q. Now, I'm reading your -- and that, by 5 the way, is one way at least to measure the 6 total aerobic/facultative viable plate count 7 of any decontaminated manure or raw manure or 8 bacteria, right? 9 A. Yes. 10 Q. Now, when I read your proposed 11 testimony, I see that you have said that 12 generally, and I'm looking at paragraph number 13 4, "Plate counts are a method of determining 14 the concentration of viable aerobic and/or 15 facultative bacteria within a liquid or solid. 16 The concentrations obtained from the plate 17 counts are given as cfu's per milliliter, 18 colony-forming units per milliliter for 19 liquids, and cfu's per gram, colony-forming 20 units per gram for solids. The plate count 21 testing method only determines the number of 22 aerobic/facultative bacteria that are alive 23 and capable of growing and forming colonies 24 and not the total count of bacteria present," 25 right? That's what you said?</p>	<p style="text-align: right;">215</p> <p>1 Q. And I need to understand how you 2 reached that conclusion. 3 A. Well, I should have said that the 4 cultivation time -- that -- does not affect 5 the count, I should say does not affect the 6 estimation of the overall population; in other 7 words, if you plate on several different 8 media, you might have -- say you plate on five 9 different media that are very similar, you 10 might have ten bacteria here, nine here, eight 11 here, five, six, seven, but it will be in the 12 same log unit. And the procedures that we use 13 for plate counts we have replications, so we 14 take several different samples from the 15 same -- several different portions of the same 16 sample. Each of those is a replication. Each 17 of those portions we would plate on more than 18 one -- each dilution on more than one plate. 19 So if you put all that together, there will 20 be some differences on individual plates, but 21 the estimated population will not 22 significantly vary. 23 Q. Okay. When you do -- and that would 24 be an example of doing several replications? 25 A. Or different replications of different</p>
<p style="text-align: right;">214</p> <p>1 A. That's right. 2 Q. And by the way, did you write this? 3 A. Yes, I did. That section I wrote. 4 Q. Okay. Here's the thing I need to 5 understand is when I read further, I see 6 there's a reference to the physical steps that 7 are taken to perform the plate count test, 8 right? 9 A. Yes. 10 Q. And I see a reference to the act of 11 counting the plates -- or counting the colony 12 forming units on the plates using subsequent 13 dilutions, et cetera, which is very standard, 14 right? 15 A. Yes. 16 Q. But there's a reference to -- and 17 is -- well, let me ask it this way: You 18 stated in the second-to-last sentence, 19 "Differences in the type of nutrient media, 20 temperature and cultivation time do not affect 21 the count. The size of each colony increases 22 with time, but the number of colonies remains 23 constant." 24 Do you see that testimony? 25 A. Yes.</p>	<p style="text-align: right;">216</p> <p>1 media. So in here when it says that the type 2 of nutrient media, temperature and cultivation 3 do not affect the count, that's what I'm 4 saying, it should really be do not affect the 5 -- do not significantly affect the estimated 6 average population. 7 Q. Okay. 8 A. This is a generic way of saying what I 9 just said. I was trying not to be too 10 technical in what I wrote here. 11 Q. Okay. So in other words, you -- it's 12 sort of like when we were talking about 13 sterilization, it's you perform a test and the 14 test is going to give you the basis for making 15 an inference about the population of bacteria 16 in the material in the sample that you've 17 tested? 18 A. Correct. 19 Q. And -- but the plate count itself 20 might differ even though the inference you 21 draw from that plate count might not matter at 22 all. 23 A. Yes. 24 Q. Okay. So this is what I need to 25 understand then. And I want to bring it down</p>

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<p style="text-align: right;">217</p> <p>1 to some hypothetical parameters.</p> <p>2 If I take a material, let's say a</p> <p>3 fertilizer composition, and I want to measure</p> <p>4 the total aerobic/facultative viable plate</p> <p>5 count of that material and in scenario number</p> <p>6 one I used tryptic soy agar but I let it</p> <p>7 incubate at 35 degrees centigrade for seven</p> <p>8 days, okay? Scenario number two I take the</p> <p>9 same exact material and I put it on a petri</p> <p>10 dish and I go through the plate count test,</p> <p>11 but this time even though it's also on tryptic</p> <p>12 soy agar, I measure it for five days at 35</p> <p>13 degrees centigrade. And then I take a third</p> <p>14 scenario. I take the same material and I put</p> <p>15 it on an agar medium, tryptic soy agar, and I</p> <p>16 let it incubate for three days at 32 degrees</p> <p>17 centigrade. Isn't it true that the plate</p> <p>18 count of each of those tests will be</p> <p>19 different?</p> <p>20 A. No, it's not a given that that will be</p> <p>21 true. And more specifically, the estimated</p> <p>22 log population would be statistically</p> <p>23 equivalent on all of those.</p> <p>24 Q. So you're saying the difference --</p> <p>25 there may be a difference, but it will be</p>	<p style="text-align: right;">219</p> <p>1 So if you know your organisms and what's</p> <p>2 there, you also know the conditions -- what</p> <p>3 parameters will change the counts in which</p> <p>4 one.</p> <p>5 Q. Okay. What if you have a bacteria</p> <p>6 other than bacillus?</p> <p>7 A. The -- what about it? I'm sorry.</p> <p>8 Q. Okay. If you're measuring -- let's</p> <p>9 make it even more concrete. If you got a</p> <p>10 fertilizer composition that includes a manure</p> <p>11 that obviously has a lot of other materials</p> <p>12 other than bacillus, and possibly not even</p> <p>13 bacillus but a wide variety of bacteria, and</p> <p>14 you test that according to different times,</p> <p>15 temperatures and medium, are you going to get</p> <p>16 the same result -- the same plate count within</p> <p>17 a logarithmic degree?</p> <p>18 A. You will using reasonable</p> <p>19 microbiological techniques. By that I mean</p> <p>20 you wouldn't -- I wouldn't try to include a</p> <p>21 temperature of -- refrigerator temperature,</p> <p>22 you'd be talking about temperatures from maybe</p> <p>23 lab bench to 30 degrees. Those are the</p> <p>24 temperature and typical ranges of incubation</p> <p>25 period. And you'd be talking about incubation</p>
<p style="text-align: right;">218</p> <p>1 within the same logarithmic range?</p> <p>2 A. That's what I'm saying. And further,</p> <p>3 some of these test conditions have more effect</p> <p>4 than others; for example, time of incubation.</p> <p>5 If you put at the same temperature and you</p> <p>6 incubate for three days at a standard</p> <p>7 incubator temperature, that's typically when</p> <p>8 we terminate an experiment. If you leave it</p> <p>9 for five days, you're not going to have new</p> <p>10 colonies that develop between days three and</p> <p>11 day five, for example.</p> <p>12 Q. Well, if the incubation time doesn't</p> <p>13 matter, then why do people measuring counts</p> <p>14 let the incubation go for five days or even</p> <p>15 seven days?</p> <p>16 A. Because it depends what organisms they</p> <p>17 are using, what they know about if the plates</p> <p>18 change or not. If it's bacillus, you do not</p> <p>19 need to let the plates go in incubators</p> <p>20 past -- if you know your strain of bacillus,</p> <p>21 like these three strains here, I don't know</p> <p>22 them specifically. The strains of bacillus I</p> <p>23 work with will grow in 24 to 48 hours, and you</p> <p>24 will get absolutely no plate count difference</p> <p>25 between 36 hours and five days.</p>	<p style="text-align: right;">220</p> <p>1 times of three to seven days, and under those</p> <p>2 conditions you will estimate statistically</p> <p>3 equivalent populations of bacteria.</p> <p>4 Q. Okay.</p> <p>5 A. And if I could just add that the --</p> <p>6 where I was going with this is to me this --</p> <p>7 what was in this document, the plaintiffs',</p> <p>8 was just too specific. There's no need.</p> <p>9 Nobody in microbiology would say you have to</p> <p>10 follow exactly this procedure to determine a</p> <p>11 plate count. You would define the conditions</p> <p>12 you used, but you wouldn't have to say that</p> <p>13 you must do exactly this agar exactly this</p> <p>14 many days and exactly this temperature.</p> <p>15 Q. Okay. Let me --</p> <p>16 (Off-the-record discussion).</p> <p>17 MR. SCHULTZ: Can you tell me how</p> <p>18 long we've been on the record?</p> <p>19 THE VIDEOGRAPHER: Approximately</p> <p>20 five and a half.</p> <p>21 BY MR. ELLIOTT:</p> <p>22 Q. Refer to Exhibit 129, please. It's</p> <p>23 probably still on the bottom. I don't know</p> <p>24 that we've talked about it yet.</p> <p>25 A. There we go.</p>

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<p style="text-align: right;">269</p> <p>1 Q. So your testimony is that the bacillus 2 bacteria in the patent that was added to the 3 fertilizer compositions was 100 percent spore 4 form? 5 A. I don't know the technical details of 6 how they added it, but my understanding is 7 that the patent talks about three specific 8 strains with ATTC numbers and that those were 9 put into the inoculant, and the typical way 10 that that's done in industry that I'm aware of 11 is to have dry spore preparations that are put 12 into the inoculant. So with those three, if 13 they were put in that way, then my 14 testimony -- my expectation would be that the 15 specific inoculated strains were applied as 16 spore treatments. 17 Q. In the case of this patent there's 18 actually a discussion of how to prepare the 19 bacillus spore suspension. Have you read 20 that? 21 A. I'm sure I read it. I don't remember 22 the details right now. 23 Q. Okay. If you look to column 18, 24 beginning at line 33 -- 25 A. Is this the '179?</p>	<p style="text-align: right;">271</p> <p>1 discussion that follows of how the bacillus 2 suspension was prepared, is it your conclusion 3 that that bacillus suspension is 100 percent 4 spore form? 5 A. I just need to continue reading a 6 little bit the rest of that section. Just 7 give me one moment. (Witness reviews 8 document). 9 Well, to be honest, this is confusing to me 10 because I see two different things are being 11 said here and the methods. One is it said, as 12 you started, the spore suspensions can be 13 prepared by conventional techniques well 14 understood by industrial microbiologists, and 15 I would submit that that would result in 100 16 percent spore preparations. 17 I work with firms that produce bacillus 18 spores routinely. They send them out to 19 industrial microbiologists, who prepare these 20 on contract basis, and they come back as 100 21 percent spores. So my understanding of 22 techniques well understood by industrial 23 microbiologists would be the state of that 24 practice. 25 The actual details of what they did, and</p>
<p style="text-align: right;">270</p> <p>1 Q. It's the '179 patent. 2 A. Column 18? 3 Q. 18, line 33, could you read through 4 that? And I'll just -- I'll read that for 5 you. '179 patent, Exhibit 1, column 18, lines 6 32 to 41 -- or 40: "The bacillus spore 7 suspension can be prepared by conventional 8 techniques well understood by industrial 9 microbiologists. Resulting spore suspensions 10 should have a viable bacillus spore count of 11 between 100 million cfu's per milliliter, 12 equals 1 times 10 to the 8 cfu's per 13 milliliter, to 10 million cfu's per 14 milliliter, equals 1 times 10 to the 10th 15 cfu's per milliliter. A typical satisfactory 16 count for the practice of the present 17 invention is 500 million cfu's per milliliter, 18 equals 5 times 10 to the 8th cfu's per 19 milliliter. For purposes of the present 20 invention, a suitable method of preparing a 21 spore suspension, for any of the bacilli 22 listed in the Summary of the Invention, is as 23 follows," and then goes through and discusses 24 that. 25 Now, based on this discussion and the</p>	<p style="text-align: right;">272</p> <p>1 you get down to where just after you stopped 2 reading, they say that -- line 45, that's 3 where they talk about one way that they are 4 doing it in their situation. And you see on 5 line 55 -- 54, the inoculated medium, so this 6 is the final result of their lab way. They 7 say -- they said you can do it the way it's 8 normally done in industrial microbiology, but 9 here's a way, and this way, line 56, most 10 bacilli will be 90 percent sporulated by 48 11 hours, so that means it's not 100 percent 12 sporulated. 13 What happens at that point with the 14 bacteria, and it looks like if you go over to 15 column 19 on the next page, they're talking 16 about another way of doing it, fermentation. 17 And ultimately down around line 12 the 18 fermenter is grown -- they're grown in the 19 fermenter for 48 hours. At 48 hours the 20 contents of the fermenter are adjusted to pH, 21 and then ultimately they -- they're used 22 directly to prepare the formulation, the 23 fermenter content. At 48 hours they would 24 most certainly not be 100 percent spores. 25 So I'm honestly confused on what exactly</p>

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<p style="text-align: right;">273</p> <p>1 was done here, but to me when we say spores 2 and they talk about spores, that's separate 3 from vegetative cells, and that was the -- 4 that was what we were -- on the claim 5 construction that was the definition that we 6 were originally discussing was spores. So I 7 do understand spore to mean spores and not 8 vegetative. 9 Q. Right. But if a bacteria -- bacillus 10 bacteria in this case is added to a fertilizer 11 and that bacteria has some vegetative cells 12 but is predominantly in spore form, the 13 bacteria is considered bacillus spores, true? 14 A. No. The spores in there I would 15 consider spores, but I would consider the ones 16 that were not as leftover vegetative cells 17 because that's what they are. I mean, they 18 differentiate in here. They say that 90 19 percent were spores, so they're saying that 20 some were not spores. And what happens to 21 those I can't say, but it's very likely that 22 they die during the shelf life of the product 23 before the product is ever applied if 90 24 percent of what they put in is in spores. But 25 they're saying spores are specifically -- to</p>	<p style="text-align: right;">275</p> <p>1 manure? 2 A. Between raw manure and fresh manure. 3 Well, I think there can be because fresh 4 manure in the general usage means that it's -- 5 how fresh is fresh? It's not real old. So 6 the other category you could have -- you could 7 have raw manure, so it's not decontaminated, 8 but it's no longer fresh. It's been sitting 9 around for, I don't know, a certain amount of 10 time, so the count has gone down naturally by 11 microbes expanding -- expending the energy and 12 dying. So I support the definition of raw 13 manure as fresh manure that has not been 14 decontaminated. 15 Q. Would it be more accurate to say raw 16 manure is manure that has not been 17 decontaminated? 18 A. I don't know if it would be more 19 accurate. I don't see why it would be more 20 accurate. I support the definition that's 21 here, raw manure is fresh manure that has not 22 been decontaminated. 23 Q. Okay. Let me pose a hypothetical 24 which you introduced. If manure is excreted 25 from a chicken, after two minutes it's fresh</p>
<p style="text-align: right;">274</p> <p>1 me, a spore is a spore. 2 Q. Sure. If you -- if instead of 90 3 percent if the material was sporulated to 30 4 percent so that only 30 percent of it was 5 spore form and 70 percent was in vegetative 6 form and you applied that material to a 7 fertilizer, would it be accurate to say you've 8 added bacillus spores in the context of this 9 patent and these claims? 10 A. To me, no. It would be correct to say 11 that you've added a combination of spores and 12 vegetative cells if you only have 30 percent. 13 Q. Okay. Let me ask you a question about 14 claim term number 2, Raw Manure. Raw manure 15 is defined by the defendants as fresh manure 16 that has not been decontaminated. That's on 17 Page 7. Do you see that? 18 A. Yes. 19 Q. Do you agree with the defendants' 20 definition of raw manure as fresh manure that 21 has not been decontaminated? 22 A. Yes, that's the generally accepted use 23 of the term. 24 Q. In your opinion, is there any 25 difference between raw manure and fresh</p>	<p style="text-align: right;">276</p> <p>1 and raw, true? 2 A. I would say so, yes. 3 Q. Okay. But if it sits there for two 4 months, it's still raw, right? 5 A. Yes. 6 Q. But it's no longer fresh. 7 A. That's right. 8 MR. ELLIOTT: Okay. Pass the 9 witness. 10 MR. SCHULTZ: We'll reserve 11 further questions. 12 MR. ELLIOTT: Thank you very much. 13 THE VIDEOGRAPHER: This is the end 14 of tape number four and the deposition of 15 Joseph Kloepper. The time is 5:45 p.m. We're 16 now off the record. 17 THE COURT REPORTER: Both of you 18 want a copy? 19 MR. SCHULTZ: I do, and send me a 20 full copy of the exhibits, too, please. 21 (Deposition concluded, 5:44 p.m.) 22 23 24 25</p>